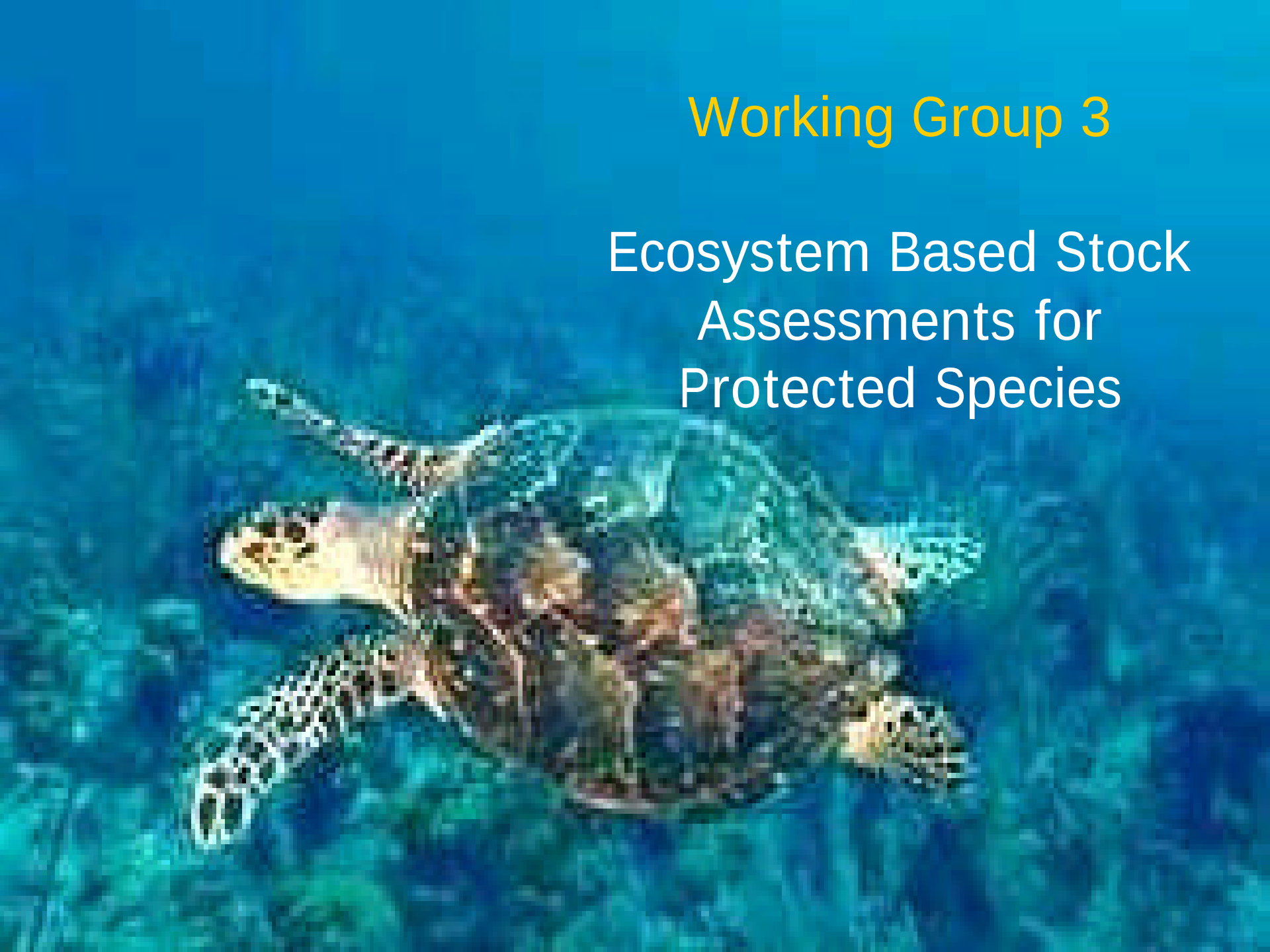
Working Group 3

Ecosystem Based Stock Assessments for Protected Species



Q1: Characteristics of a region-specific national program

- Purpose is to provide management advice on protected species
- Refers to a synthesis of quantitative and qualitative information that includes ecosystem considerations such as physical habitat, trophic and other biological interactions, pollutants, anthropogenic noise, disease, etc

Q1: Characteristics of a region-specific national program

Guiding Principals:

1. Ecosystems include interactions among many components, and extracting any resource from an ecosystem will affect other components
2. Ecosystem interactions are complex, and there is uncertainty in predicting indirect effects on other components
3. Ecosystems may change abruptly from one domain or stable state to another; and these changes may not be predictable and may not be reversible on a decadal time scale.

Q1: Characteristics of a region-specific national program

- Wide range of assessment models:
  - Classic single species
  - Augmented single species
  - Multi-species
  - Tropho-dynamic ecosystem
  - Bio-geo-chemical ecosystem

Q1: Characteristics of a region-specific national program

- Region-specific:
  - Variety of spatial scales, from LME to eco-regions
  - Characterized by physical and biological features
  - Facilitate assessments by organizing the implementation and coordination of research and monitoring programs

Q1: Characteristics of a region-specific national program

- National Program:
  - Clear goals, flexible, adaptive
  - National priority
  - Break down stove pipes within centers and between agencies
  - Include a forum to
    - Discuss objectives and allocation among stakeholders
    - Review science
    - Develop mitigation measures

Q1: Characteristics of a region-specific national program

- National Program:
  - Realistic goals
  - Include:
    - Shared information systems
    - Communication processes
    - Knowledgeable staff
    - Data collection programs

Q1: Characteristics of a region-specific national program

- Ecosystem Based Stock Assessment for Protected Species:
  - Multi-disciplinary
  - Explicitly include the target species
  - Simple, explainable, effective
  - Robust to address data-poor areas and species
  - Incorporate uncertainties
  - Include studies of impacts of stressors

Q1: Characteristics of a region-specific national program

- Ecosystem Based Stock Assessment for Protected Species:
  - Include quantitative and qualitative sections
  - Use standardized terms and approaches
  - Include both top-down and bottom-up components
  - Include control laws that consider ecosystem issues

Q2: Experiences which demonstrate how this approach would inform ecosystem based protected species management

- Best cases are not of protected species
- Generic to all marine species
- Enriched single species models
  - Used to set quotas (allowable takes)
  - Barents's sea cod, Baltic sea cod, capelin
  - CCAMLR krill
  - ETP dolphins

Q2: Experiences which demonstrate how this approach would inform ecosystem based protected species management

- Multi-species models
  - Mostly used to explore management strategies not set annual quotas
  - Multispecies VPA for North Sea and Baltic fish stocks
  - Barents Sea and Icelandic waters, include marine mammals
  - Benguela Current system – hake and marine mammals
  - Bering Sea pollock and Steller sea lions

Q2: Experiences which demonstrate how this approach would inform ecosystem based protected species management

- Tropho-dynamic models
  - Used to explore scenarios, evaluate robustness of management strategies, not to conduct regular assessment
  - ECO-Path and other mass-balance models
  - Size-based models
  - Atlantic, CCAMLR, IWC

Q2: Experiences which demonstrate how this approach would inform ecosystem based protected species management

- Bio-geochemical ecosystem models
  - Everglade model
  - Puget Sound Collective process
  - Used in management decisions
  - Very costly

Q3: Research, data, models, and information management

- Initially, use existing data to:
  - Review what is known and not known
  - Examine why some reduced stocks have failed to recover and others have recovered
  - Review case studies for indirect ecosystem impacts
  - Review case studies for ecosystem state changes
  - Review of human activities on the seas and coastal waters
  - Review data on human demography, distribution and resource needs

Q3: Research, data, models, and information management

- Really Important:
  - better long-term spatially resolved monitoring data to better understand environmental variability
  - better long-term spatially resolved data on human marine/maritime activities for risk assessment
  - better time series data to help calibrate and validate numerical models
  - better trend, biomass and abundance estimates
  - better estimation of trophic transfer rates
  - better historical data series (reconstructed?)
  - better information on habitat use and dispersal to estimate exposure to various anthropogenic hazards
  - better understanding of the acute and chronic effects of various stressors on morbidity not just mortality
  - better understanding of marine species behavior to better evaluate effects of external stressors
  - better information on disease/parasite effects
  - better information on stock structure (age-sex, spatial)

Q3: Research, data, models, and information management

- Important:
  - ask more insightful ecological questions
  - consider boundary issues such as land-sea interface
  - better methods for data assimilation in ecological models
  - better evaluation of the efficacy of management actions to reduce mortality
  - better information on foraging ecology
  - better indices to support objective decision making
  - better sub-sea surface oceanographic data (temperature, currents etc)
  - better understanding of environmental forcing, food habitat requirements (use bycatch), life history traits, effects of anthropogenic sound, and effects of catastrophic events on species viability and survival (especially at low population levels)
  - contemporaneous sampling of environmental factors
  - develop indicators to help monitor health of protected species
  - development of informative case studies of ecosystem change
  - diagnosis of reasons for why some stocks fail to recover while others do recover
  - external review of research projects
  - readily accessible data inventories and meta-data
  - socio-economic research (human demands for resources)
  - undertake comparative life history studies

Q3: Research, data, models, and information management

- Given at present have to provide single species management advice under different mandates, augmented single species models are most tractable for short term
- Incorporate into models factors that could limit population dynamics and recovery
  - Not: trophic dynamics, energetic role in ecosystem
  - More likely: disease, pollutants, algal blooms, noise, Allee effects, environmental effects

Q3: Research, data, models, and information management

- Use more complex models to:
  - understand trophic dynamics
  - assess risks and impacts to single/multiple stressors
  - develop control rules
- For any type of model need to:
  - Deal with uncertainty
  - Verify model
  - Do sensitivity analyses

Q3: Research, data, models, and information management

- Information Systems:
  - Improve access to data
  - Improve metadata and auditing standards
  - Codify best practices
  - Structure data to facilitate display and interpretation of data for managers and public

Q4: Changes to policy, governance and science administration

- Policy level commitment to EAM is there, what is missing are clear structures and practice to implement those policies.
- Expand definition of PBR and TRTs
- Consolidate fishery management and protected species regulations
- Clarify issues of rights versus privileges in granting access to resources
- Use qualitative info in decision making
- Think in terms of aggregate rather than cumulative impacts
- Include human behavior and cultural factors in EAM

Q4: Changes to policy, governance and science administration

- Governance:
  - Create an overseeing Marine Ecosystem Council
  - Current species-based structures have broader representation
  - Expand authority of current species-based governance structures (e.g., TRTs) for broader stewardship mandate and stakeholders
  - Clarify central and regional roles of existing governance structures
  - Need mechanism for continuous funding of critical structures and operations (e.g., observer and ENF)

Q4: Changes to policy, governance and science administration

- Administration
  - Need to re-structure within Science Centers
  - Need to develop closer partnerships with others
  - Consider creating a Marine Conservation Management Agency by combining NMFS, FWS, MMC, EPA, and others
  - Consider creating one body that provides science advice to all clients (fisheries, protected resources, sanctuaries, etc) to ensure a consistent message
  - Create a forum for reviewing ecosystem assessments
  - Hold multi-disciplinary workshops and conferences

Q4: Changes to policy, governance and science administration

- Things we can do right now!!
  - Improve communication
  - Include a section on ecosystem considerations in all MMPA Stock Assessment Reports and ESA status reviews.